Pottenger's Cats and Us

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Dr. Francis Marion Pottenger, Jr., conducted experiments on cats from 1932-1942. His experiments are unique – there are no others like them in medical literature.

He was creating adrenal extracts, and at the time, there was no way to standardize them. Some batches would be more potent than others. Cats die without their adrenal glands, so the dose of extract required to support their lives could be used to calibrate the level of the extract's potency. But many of the cats were dying after their glands were removed.

Like any good doctor, Dr. Pottenger wanted to improve the health of the cats before they had their glands removed to increase their chances of living after the operations. He fed them a diet of market grade raw milk, cod liver oil and cooked meat scraps. These scraps included liver, tripe, pancreas, brains, heart, and muscle. This diet was considered to be rich in all the important nutritive substances by the experts of the day. In seeking an explanation, he began noticing that the cats showed signs of deficiency. All showed a decrease in their reproductive capacity, and many of the kittens born in the laboratory had skeletal deformities and organ malfunctions.

Many people donated cats to the laboratory, and soon the demand for cooked meat scraps exceeded the supply. Dr. Pottenger ordered raw meat scraps, including the internal organs, muscle, and bone, from his local butcher. These raw meat scraps were fed to a separate group of cats each day, and within a few months this group appeared to be in better health than the animals being fed cooked meat scraps.

The contrast in the apparent health of the cats fed raw meat and those fed cooked meat was so startling, it prompted Dr. Pottenger to undertake a controlled experiment. He wanted to find answers to such questions as: Why did the cats eating raw meat survive their operations more readily than those eating cooked meat? Why did the kittens of the raw meat fed cats appear more vigorous? Why did a diet based on cooked meat scraps apparently fail to provide the necessary nutritional elements for good health? He felt the findings of a controlled feeding experiment might illuminate new facts about optimal human health.

The cats were kept in large outdoor pens with access to sunlight and shelter from wind and rain. They had a sandbox to use as a litter box, and their litter was removed and kept in separate piles depending on which test group they were in. These piles were used as fertilizers in later experiments with plants.

The Cat Study involves several generations of cats, so we need to understand how the different groups are classified. The word *diet* describes the actual food intake of the individual cat. An *optimum diet* refers to a diet of raw food including raw meat, raw milk and cod liver oil. A *deficient diet* refers to a diet including one or more cooked foods plus cod liver oil. Cod liver oil is routinely included in all experimental diets as a rich supplemental source of vitamin A.

According to the diet variables of raw or cooked foods, the cats are grouped in three general health classifications: (1) Normal, (2) Deficient, and (3) Regenerating.

Normal cats are born of healthy parents and are maintained on an optimum diet of raw food and cod liver oil. They are the control cats used for comparison with the deficient and regenerating cats. The

breeding males used in the various experiments are always of this normal group, and are of proven fertility so that experimental results primarily reflect the condition of the health of the mother cats.

First Generation Deficient Cats: These cats are either mature cats donated to the study or mature cats born of experimental animals and raised on an optimum diet. When these adult cats are placed on deficient diets including cooked food, they are called deficient cats of the first generation.

Second Generation Deficient Cats: These cats are the kittens born to females of the first deficient generation eating a deficient diet for various lengths of time prior to and during gestation and lactation. At the end of nursing, these kittens are maintained on a deficient diet.

Third Generation Deficient Cats: These cats are the kittens born of the second deficient generation and maintained on deficient diets all their lives.

When a female cat of the first deficient generation is placed back on an optimum raw diet after giving birth to a deficient litter, her next kittens, benefiting from her improved diet, are called *Regenerating Kittens of the First Order*.

Regenerating Kittens of the Second Order: These kittens are born to a cat of the second deficient generation and placed on an optimum diet.

There are never more than three generations of deficient cats because of the third generation's inability to produce healthy offspring. Consequently, there are no third or fourth orders of regenerating cats.

Experiment 1: Raw Meat Versus Cooked Meat

Raw Meat Group. The cats fed a diet of 2/3 raw meat, 1/3 raw milk, and cod liver oil show striking uniformity in their sizes and their skeletal developments. From generation to generation they maintain a regular, broad face with prominent cheekbones and orbital arches, adequate nasal cavities, broad dental arches and regular tooth arrangement. The configuration of the female skull is different from the male skull, and each sex maintains its distinct anatomical features. The membranes are firm and of good, pink color with no evidence of infection or degeneration. Tissue tone is excellent, and the fur is of good quality with very little shedding. In the older cats, particularly the males engaging in fighting, the incisors are often missing, but inflammation and disease of the gums is seldom seen.

Their internal organs show full development and normal function. Over their life spans, they prove resistant to infections, to fleas, and to various other parasites, and show no signs of allergies. In general, they are gregarious, friendly, and predictable in their behavior patterns, and when thrown or dropped as much as 6 feet to test their coordination, they always land on their feet and come back for more "play." These cats reproduce one homogeneous generation after another. Miscarriages are rare, and the litters average five kittens with the mother cat nursing her young without difficulty.

Here is a comparison of a cat with normal teeth and one with teeth that are mis-aligned.

Cooked Meat Group. The cats fed a diet of 2/3 cooked meat, 1/3 raw milk, and cod liver oil reproduce a heterogeneous strain of kittens, each kitten in a litter being different in size and skeletal pattern. When comparing the changes in configuration found in their X-rays, there are almost as many variations in the facial and dental structures of the second and third generation cooked meat fed animals as there are animals. Evidence of deficiencies is written so plainly on their faces that with a little training, any

observer can be almost certain that a given cat has been subjected to a deficient diet or that it comes from a line of cats that has suffered from deficient nutrition.

The long bones of cooked meat cats tend to increase in length and decrease in diameter with the hind legs commonly increasing in length over the forelegs. The internal structure of the bones becomes coarser and shows evidence of less calcium. In the third generation, some of the bones become as soft as rubber and a true condition of brittle bones is present.

Heart problems; nearsightedness and farsightedness; under-activity of the thyroid or inflammation of the thyroid gland; infections of the kidney, of the liver, of the testes, of the ovaries, and of the bladder; arthritis and inflammation of the joints; inflammation of the nervous system with paralysis and inflammation of brain and spinal cord membranes – all occur commonly in these cooked meat fed cats. There is a decrease in the volume of their chest and abdominal cavities.

Infections of the bone appear regularly and often appear to be the cause of death. By the time the third deficient generation is born, the cats are so physiologically bankrupt that none survive beyond the sixth month of life, thereby terminating the strain.

A study of the microscopic sections of the lungs of second and third generation deficient cats show abnormal respiratory tissues. The lungs become engorged with blood, some accumulate fluid, and some cannot expand the lungs fully, while the most deficient show inflammation of the lung tissue and/or the mucus membranes of the bronchial tubes. In several cases, an underactive thyroid condition exists which is not observed in raw meat fed cats.

Cooked meat fed cats show much more irritability. Some females are even dangerous to handle. The males, on the other hand, are more docile, often to the point of being unaggressive, and their sex interest is slack or perverted. In essence, there is evidence of a role reversal with the female cats becoming the aggressors and the male cats becoming passive as well as evidence of increasing abnormal activities between the same sexes (homosexuality). Such sexual deviations are not observed among the raw food cats.

Parasites on the skin and in the intestines abound. Skin lesions and allergies appear frequently and are progressively worse from one generation to the next. Pneumonia and body cavities filling with pus are among the principal causes of death in adult cats while diarrhea followed by pneumonia takes a heavy toll on the kittens.

At autopsy, cooked meat fed females frequently show smaller than usual ovaries and congestion in the uterus, and the males often show failure in the development of active sperm. Abortion in pregnant females is common, running about 25% in the first deficient generation to about 70% in the second generation. Deliveries are generally difficult with many females dying in labor. The mortality rate of the kittens also is high as the kittens are either born dead or are born too frail to nurse. Following delivery, a few mother cats steadily decline in health only to die from some obscure physiological exhaustion in about three months. Other cats show increasing difficulty with their pregnancies and in many instances fail to become pregnant.

When cats of the first and second generation cooked meat fed groups are returned to a raw meat diet, they are classified as regenerating animals of the first and second orders. Their offspring are then maintained on an optimum diet to measure the time needed to rebuild their health to that of the normal cats. It requires approximately four generations for either order to regenerate to a state of normal

health. However, because of the lack of reproductive efficiency, very few deficient animals regain the normal health noted before deficiency was imposed on their line of cats.

Improvement in resistance to disease is noted in the second generation regenerating cat, but allergic manifestations persist into the third generation. In the third generation, skeletal and soft tissue changes are still noticeable, but to a lesser degree; and by the fourth, most of the severe deficiency signs and symptoms disappear – but seldom completely.

One of the experiment's more startling discoveries is that once a female cat is subjected to a deficient diet for a period of 12 to 18 months, her reproductive efficiency is so reduced that she is never again able to give birth to normal kittens. Even after three or four years of eating an optimum diet, her kittens still show signs of deficiency in skeletal and dental development. When her kittens are maintained on an optimum diet, a gradual reversal and regeneration takes place.

Experiment 2: Raw Milk Versus Cooked Milk

This feeding experiment involves four groups of cats. One group receives a diet of 2/3 raw milk, 1/3 raw meat, and cod liver oil. The other groups receive a diet of either 2/3 pasteurized milk, 2/3 evaporated milk, or 2/3 sweetened condensed milk plus 1/3 raw meat and cod liver oil.

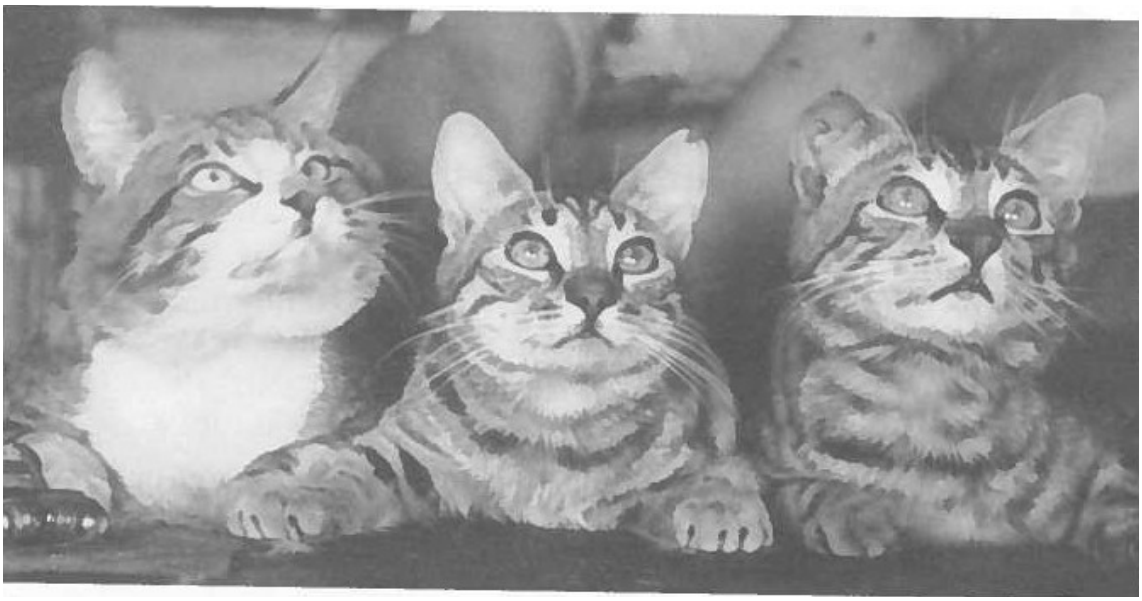
The results of this experiment correspond to those of the raw meat versus cooked meat experiment. Animals on raw milk and raw meat reproduce homogeneous litters and the usual causes of death are old age and injuries suffered in fighting. They are generally healthy animals with normal anatomic measurements and good resistance to disease. Their fur is of good quality with a notable sheen, and they show no signs of allergy.

The cats fed pasteurized milk as the principal item of their diet show skeletal changes, lessened reproductive efficiency, and their kittens present progressive constitutional and respiratory problems.

Cats fed evaporated milk show even more damage than their pasteurized counterparts while the most marked deficiencies occur among those fed sweetened condensed milk. The cats on sweetened condensed milk develop much heavier fat deposits and exhibit severe skeletal deformities. They show extreme irritability and pace back and forth in their pens nervously.

Deficiency can be seen with the degrees of underactive thyroid in generations of cats. Thyroid deficiency produces marked disturbances in bone development. Among the nursing mother cats on a raw meat, raw milk diet, there are no incidences of hypothyroidism among the kittens. Among the nursing mothers on cooked diets, there is a significant number of kittens with thyroid deficiency.

This picture compares a kitten born of a thyroid deficient mother with kittens born of raw meat and cooked meat fed mothers.



B-530 C-508 A-534

Fig. 6.1 – Left to right, male kittens 530, 508, and 534, all 18 months of age. No. 530, regenerating, first order, first litter, hypothyroid. Note failure in development of orbital arches and cheekbones. No. 508, second generation, first litter cooked-meat kitten. Note smallness of head, retraction of chin, and failure in development of orbital arches and cheekbones. No. 534, raw-meat cat.

Cat A (on the right) is a typically healthy male from healthy parents eating raw meat. He has a large skull, large bones, a large chest, a large, long body and relatively short legs. His dental arches are broad, and he has excellent teeth which are regular and well spaced.

Cat B (on the left) is born of a mother with a deficient thyroid. The mother has been on a raw food diet for a year preceding his birth. Though Cat B is approximately the same age as Cat A, he shows markedly inferior development. There is a failure in the development of his face so that his teeth are crowded and narrow. His skull is smaller, his thorax smaller in diameter, his body shorter and his legs longer than those of Cat A. All his soft tissues are inferior meaning that their color is pale rather than red, that their elasticity is poor, that the muscle tone is poor, and that the fat is watery and white. As is typical of cats from hypothyroid mothers, he shows a much lower percentage of calcium and phosphorus in his femurs.

Cat C (middle) is an animal born of a cooked meat mother and kept on cooked meat all his life. He has a small skull, very narrow dental arch, irregular dentition, small body and long legs. He is functionally sterile and all his soft tissues are of very inferior quality.

Summary of Findings of the Cat Study

On controlled experimental diets we have been able to bring about developmental failure in cats. We have shown that allergic manifestations and dental disturbances comparable to those seen in human beings result from changes in food preparation.

The normal, wild cat subsists upon rodents, birds, reptiles, insects, fish, and a small amount of vegetation and maintains regular features and normal functions generation after generation. Ordinary

house cats, living a semi-wild life, also maintain regular features and functions generation after generation. In contrast, cats which are prevented from hunting, subjected to a life of ease, and fed prepared, cooked foods show poor development.

When deficiency is produced in kittens, it cannot be reversed even under intense therapy. A well developed cat can be maintained in a healthy state on deficient food if thyroid and adrenal hormones are added to her diet. A deficient kitten, even if given raw food, thyroid and adrenal hormones, does not appear to become a normal cat.

One of the earliest defects noticed in the cats on cooked food is poor dento-facial development. The temporary teeth of both cats fed cooked foods and those fed raw foods seem well developed; however, when the permanent teeth displace the temporary ones, the cats on cooked food usually develop three or four irregularly spaced, uneven, crowded teeth instead of the usual six. This is true of both the upper and lower jaws. Decrease in the size and increase in irregularity of their teeth leads to malalignment.

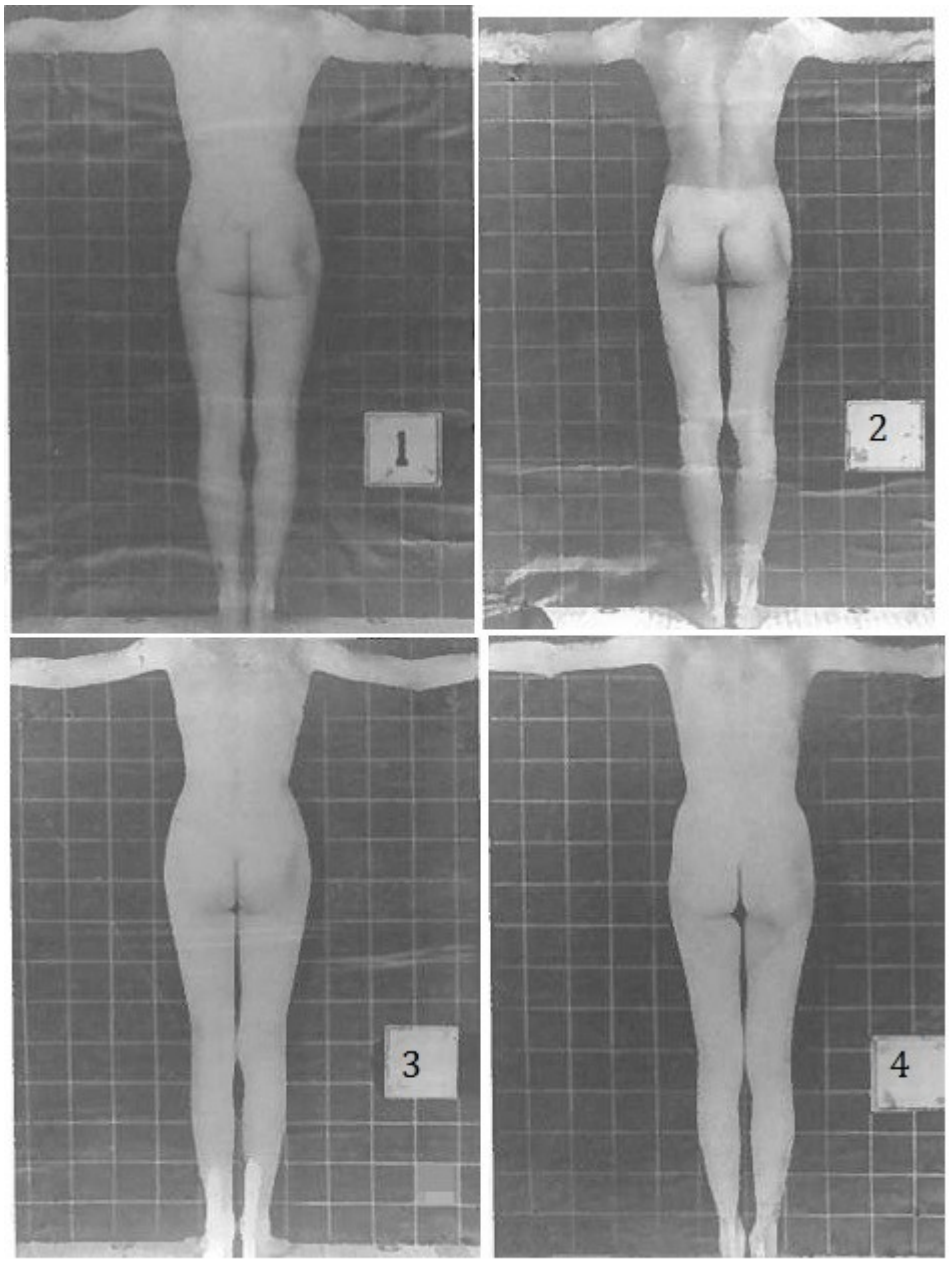
Deficient cats exhibit progressive allergic symptoms from generation to generation. They show most of the common respiratory, gastrointestinal, and constitutional problems as well as various skin disorders. Their fur shows inferior quality, and their dispositions are much more nervous and irritable than those of normal cats. Hypothyroidism is prevalent and contributes to marked disturbances in the bone development of some deficient cats and to apparent disturbances in their reproductive efficiency.

Cats can be so reduced in vitality by just one year of a diet considered adequate for human consumption that it may take them from two to three years to recover from the injury, if they can recover at all.

I mentioned earlier that the cat’s litter was used as fertilizer to see how it affected plants. Dr. Pottenger experimented with different feeding groups, but the best plants always came from plots fertilized with cats on the optimum (raw) diet. Here are the visual results of one such experiment.

Fig. 13.1. Upper left: raw milk males. Upper right: pasteurized milk males. Lower left: evaporated milk males. Lower right: sweetened condensed milk males.

Now, how about humans? Which are girls and which are boys?



ANSWER: Numbers 1 and 4 are boys, numbers 2 and 3 are girls. Ages are between 15 and 17 years.

Experimental work with animals shows a loss of secondary sexual characteristics after two or three generations on impoverished diets. Males lose their heavy masculine frame and their general contour begins to resemble the female. Females also tend to lose their distinguishing build so that both sexes approach a state of physical neutrality. The male no longer has the strength of body that normally makes him the breadwinner and dominant personality. The female no longer has the pelvic capacity required for easy childbearing.

Now, what are some of the indications that the average human diet is deficient? Some things easily recognized by a large portion of our population are: thin, splitting, peeling nails due to disturbance in protein assimilation, especially lysine; thin skin due to lack of fat, or the reverse, thick skin, which cannot be picked up between the fingers due to lack of iodine, or to excessive carbohydrate intake; and dry, brittle, lack-luster hair caused by too little unsaturated fatty acid. Moreover, a poorly nutritioned individual is apt to be irritable and unpredictable without cause. Exhaustion, in varying degrees, is a universal symptom of deficiency. Less apparent indices of deficient nutrition relate to the development of the bones and ligaments as well as dentofacial structures.

Signs of poor ligaments due to deficient nutrition can be seen from infancy on. The signs are: hyperextensile elbow joints, hyperextensile shoulder joints, hyperextensile knee joints with lateral play, wrist bones that can be pulled apart, waddling roll to the hips, weak ankles and dynamically and statically flat feet.

Dr. Pottenger recommended sprouted whole grains, raw milk, fresh fruit and vegetables, animal fats and essential fatty acids, eggs, gelatin, and minimally cooked meat (muscle meat and organ meats) for optimum human health. He supplemented the diets of nutritionally-deficient children and obtained good results with normalization of the bone and dental structures, better behavior, and the same general results that Weston Price found in cultures which ate their traditional diets instead of the white man's deficient foods.

Another doctor conducting experiments with diets during the 1920's and 1930's – so a little before Price and Pottenger – was Dr. May Mellanby. She was conducting trials to determine the effect of vitamin D and nutrition on the development of tooth decay. She did her experiments in resident hospitals and orphanages, which allowed precise control over food intake. She explored the effects of 8 different diets from the years 1924 to 1932.

The diet she fed the children was unremarkable; here is a sample from her 1932 menu:

> Breakfast: Scrambled egg, milk, fresh salad.
> Lunch: Irish stew, potatoes, cabbage, stewed fruit, milk.
> Tea: Warmed minced meat, green salad, milk.
> Dinner: Thick potato soup made with milk.

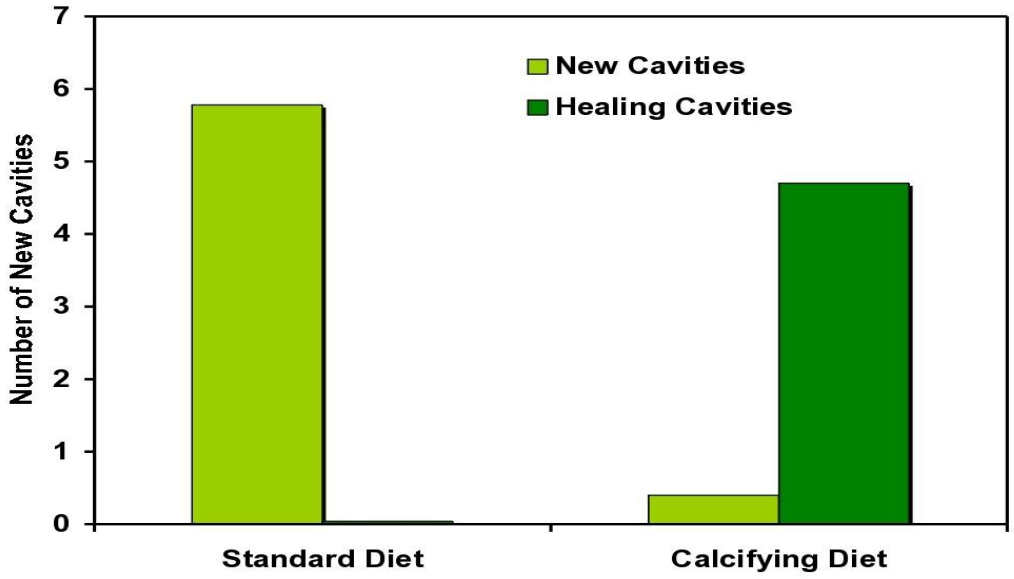
The diet contained no organ meats, bone marrow, shellfish, or fermented foods. Her 1932 investigations also eliminated cereal, bread, rice, and other grains. The amount of calories the children ate was consistent in her 8 diets. But in her 1932 experiment, the source of those calories was significantly altered; in this diet the children received many more calories from milk, cream, butter, fish, eggs, and cooking fat to make up for the lack of calories supplied by cereals in the previous experiments.

Added sugar (including jam and syrup) was limited to 57g per day, or about 14 teaspoons. Today in the US, children and adolescents consume on average 26 teaspoons of added sugar per day. Milk was served with all meals so that each child received about one quart (liter) per day, but it was not stated whether the dairy was raw or pasteurized. This provided about 1200mg of calcium out of a daily total of 1700mg, and also provided considerable phosphorus.

Vitamin D was supplemented using cod liver oil or vitamin D supplements (to about 2000 IU per day). In her previous diets the amount of cod liver oil was approximately 21 grams per day, but it was reduced to nearly one-third that amount (8.5 grams per day) in her 1932 diet, and other vitamin D supplementation was not increased. But vitamin D intake will be greater when a person consumes more eggs, milk, fat, etc..

Here we see some of the results Dr. Mellanby obtained during her studies. She measured the number of teeth with cavities per child, as well as the extent or severity of the cavity, and the number of teeth which showed mineral hardening (the healing of cavities).

	1932	1928	1924 and 1926		
	Cereal-free. Rich in Vit. D	Rich in Vit. D (irradiated ergosterol)	Rich in Vit. A & D from cod liver oil	Some extra Vit. A & D from cod liver oil	No extra Vit. A & D. Increased oatmeal.
Average number of teeth per child showing initiation or spread of caries	0.37	1.0	1.4	3.3	5.0
Average "degree" or extent of increase of caries per child	0.32	1.1	1.7	4.5	6.0
Average number of teeth per child in which caries showed hardening	4.7	3.9	3.7	1.2	0.2



Over a six month period, those children following Dr. Mellanby's diet experienced very few new cavities (93% fewer!), and pre-existing cavities stopped growing and began to heal! But those children on the Standard Diet continued to developed more new cavities with no healing.

These different outcomes were not due to the amount of sugar consumed, how they brushed their teeth, or even "genetics". The results demonstrate that the prevention of new cavities, and even the arrest and healing of existing ones, is achievable by following a **calcium-rich diet with optimal intake of vitamin D**.

So again there is an emphasis on the fat soluble vitamins, just as Price found. Vitamins A and D need to be included in the diet daily for optimal health, and the best way to get those fats is from animal sources, specifically fatty, cold-water fish and liver.

So what can you do to incorporate this information into your life?

- Eat as much fat from various animal sources as possible: milk, cream, butter, cod liver oil and fatty fish, beef fat, etc.
- Add liver and organ meats to your diet. Eat the cartilage and gelatinous and gristly bits – cook them down in a meat or bone broth!
- Consume eggs regularly.
- Soak grains to remove the anti-nutrients before you cook them.

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